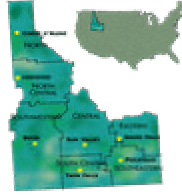


SOUTHEAST IDAHO



SPOTTER NEWS

NATIONAL WEATHER SERVICE POCATELLO/IDAHO FALLS SUMMER 2003

Editors' Notes

The Southeast Idaho Spotter News is back and is a tribute to all spotters and media who take time out and provide us with critical weather information.

Spotter's reports are a vital part of our daily operations, especially during periods of severe weather.

Remember, if you spot any severe weather in your area, please notify us at 1-800-877-1937.

If there is something that you would like to see in the next quarterly newsletter (Oct), please write or call me.

Ken Simosko
C/o Spotter News
1945 Beechcraft Ave.
Pocatello, ID 83204
208-233-0834
e-mail:
ken.simosko@noaa.gov

Sunny Days Ahead!

Weather Spotter Of the Quarter

Our weather spotter of the quarter is Scott Curtis from Island Park!



Scott provided us with invaluable weather information during the winter and spring months with daily reports of precipitation in an area where Doppler Weather Radar has a hard time detecting precipitation. Winter Weather Recreation in Fremont County is important to many people, and being accurate and timely in issuing warnings is a must. Scott's reports enabled us to make critical decisions in issuing winter storm warnings. Scott's dedication and contribution as a weather spotter to the National Weather Service helped save lives and property. This makes Scott our weather spotter of the quarter.

On The Weather Menu Inside...

Get to Know our Pocatello Staff
Weather News You Can Use
Refresher Spotter Information
Weather Internet Web Sites
Weather Question Corner
Weather Quiz

SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

Get to Know Us! Your National Weather Service (NWS) is made up of 15 Meteorologists, 3 Hydrometeorological Technicians, 1 Information Technologist, 1 Hydrologist, 1 Secretary and 3 Electronic Technicians. We are available 365/24/7. A break down of our staff:



National Weather Service
1945 Beechcraft Ave.
Pocatello, Idaho 83204

PHONE: (208) 233-0834
FAX: (208) 233-2417
Web Site: <http://www.wrh.noaa.gov/Pocatello>

<i>Name/Position</i>	<i>Experience</i>	<i>Time at Pocatello</i>
James Meyer/Meteorologist-In-Charge (Boss)	24 Years	1 Year
Donna Mills/Secretary	20 Years	8 Years
Vernon Preston/Warning Coordination Meteorologist	16 Years	5 Years
Dean Hazen/Science Operations Officer-Meteorologist	20 Years	9 Years
Bill Snyder/Information Technology	1 ½ Years	1 ½ Years
Sherrie Hebert/Hydrologist (Meteorologist)	Less Than 1 Year	Less Than 1 Year
Thomas A./Lead Forecaster (Meteorologist)	15 Years	8 Years
Robert Survick/Lead Forecaster (Meteorologist)	18 Years	8 Years
Mike Huston/Lead Forecaster (Meteorologist)	13 Years	6 Years
Rick Winther/Lead Forecaster (Meteorologist)	18 Years	5 Years
Jeff Hedges/Lead Forecaster (Meteorologist)	13 Years	2 Years
Bill Wojcik/Journey Forecaster (Meteorologist)	9 Years	4 Years
Jack Messick/Journey Forecaster (Meteorologist)	9 Years	4 ½ Years
Greg Keiser/Journey Forecaster (Meteorologist)	15 Years	3 Years
Dawn Harmon/Journey Forecaster (Meteorologist)	8 Years	5 Years
Ken Simosko/Journey Forecaster (Meteorologist)	13 Years	1 ½ Years
Nathan Heinert/Intern (Meteorologist)	1 ½ Years	Less Than 1 Year
Paul Angel/Hydrometeorological Technician	30 Years	10 Years
Dave Phelps/Hydrometeorological Technician	11 Years	8 ½ Years
Gary Wicklund/Hydrometeorological Technician	35 Years	Less Than 1 Year
Rick Stork/Chief Electronic Maintenance	27 Years	8 Years
Bryan Tilly/Electronic Maintenance	16 Years	4 Years
Rich Denning/Electronic Maintenance	26 Years	1 ½ Years

SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

Weather News You Can Use:



What is NOAA Weather Radio?

NOAA WEATHER RADIO (NWR) is a nationwide network of radio stations broadcasting National Weather Service (NWS) warnings, watches, forecasts and other hazard information 24 hours a day. Working with the Federal Communications Commission's (FCC) Emergency Alert System, NWR is an "all hazards" radio network, making it your single source for comprehensive weather and emergency information. NWR broadcasts warning and post-event information for all types of hazards – both natural (such as earthquakes and volcano activity) and environmental (such as chemical releases or oil spills).

Known as the "Voice of NOAA's National Weather Service," NWR is provided as a public service by the National Oceanic & Atmospheric Administration (NOAA), part of the Department of Commerce. As of October 1, 2002, NWR includes more than 760 transmitters, covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. NWR requires a special radio receiver or scanner capable of picking up the signal. NOAA Weather Radio receivers can be purchased at many retail stores and through mail order catalogues and Internet web sites that sell electronic merchandise. They are often available at boat and marine accessory outlets. Broadcasts are found in the public service band at 7 frequencies.

NWR service depends on reliable signal reception, typically a 40-mile radius from the transmitter, assuming level terrain. Some counties, especially in mountainous areas, may not have reliable reception due to signal blockages or excessive distance from the transmitter.

NWR Specific Area Message Encoder (SAME) receivers employ digital coding to automatically activate for specific weather or emergency conditions in specific areas (typically a county or portion of a county). You program SAME receivers for the county(s) and types of products you require. Your receiver will then automatically alert you only of weather and other emergencies in areas you programmed. SAME county code numbers are available by telephone, 1-800-NWR-SAME (1-888-697-7263), or website, <http://www.nws.noaa.gov/nwr/indexnw.htm>. Your receiver manufacturer instructions will describe how to select for particular types of products. Television, cable and radio stations can use SAME to allow their listeners to hear warnings as they are issued. Less sophisticated NWR receivers are equipped with the warning alarm or tone alert feature. These receivers will either sound an alarm, or when operated in mute mode, will automatically turn the volume on so the warning message may be heard.

Our staff at the Pocatello National Weather Service can do special live broadcasts and recordings using the headphone equipment. Warnings are generated to activate the Emergency Alert System (EAS) heard on commercial and cable TV and radio stations whenever threatening weather occurs. The Pocatello NWR Transmitter is WXL-33 which operates on a frequency of 162.55 MHz.

SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

Spotter Information: A brief refresher of what to report during summertime severe weather.

Suggested Reporting Style:

IDENTIFY YOURSELF

What have you seen?
Where did you see it?
When did you see it?
What is it doing now?
How much has happened?



For Tornadoes and Funnel Clouds

Ensure they are ROTATING columns of air
Dust or debris may be visible below funnel
Where is the funnel or tornado located and what direction does it appear to be moving
Report rotating Wall Clouds

For Hail

Report Hail Size and Depth on Ground

SIZE	DIAMETER
Pea Size	¼ inch
Marble Size	½ inch
<u>SEVERE CRITERIA</u>	
Penny or Dime	¾ inch
Quarter	1 inch
Golfball	1 ¾ inches
Tennis Ball	2 ½ inches

Reporting Damaging Wind (Estimated)

55-75mph: Damage to TV antennas; Shallow rooted trees overturned
75-112mph: Peels surface off roofs; Windows broken; Trailers overturned
113-117mph: Roofs torn off houses; Trailers destroyed; Large trees snapped and uprooted
158+mph: Severe to extreme damage to all property; cars are airborne

Frequent Cloud to Ground Lightning

Lightning strikes that hit the ground at least once a minute
Lightning that has hit structures or trees
Near continuous flashes

Heavy Rain/Flooding (Use the NWS provided rain gauge)

Report any amounts over 1 inch and report to the nearest .10 of an inch
When you observe water flowing over paved streets
When debris or mud are flowing down roads or hills
When creeks, streams, and gullies have water topping them
When water is rising in rivers or topping levees
When water is damaging homes

Reduced Visibility

Report reduced visibilities that are below ½ mile due to Fog/Dust/Rain.

SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

Useful Weather Web Sites: Each Quarter, new web sites will be added to help you browse for weather information. Many phone calls we receive here at the office are answered by going to a particular website below to obtain the answer. If you have web sites like these and wish to share them with other spotters and media, please write or call me so they can be included in October's issue.



National Oceanic And Atmospheric Administration (NOAA): <http://www.noaa.gov>

National Oceanic And Atmospheric Administration (NOAA) Education Resources: <http://www.education.noaa.gov/>

National Weather Service (NWS): <http://www.weather.gov>

National Weather Service Forecast Offices: <http://www.wrh.noaa.gov/wrhq/nwspage.html>

National Weather Service Organizations/Weather Offices By Region: <http://www.nws.noaa.gov/organization.html>

Pocatello National Weather Service: <http://www.wrh.noaa.gov/Pocatello/>

NWS Office Of Climate, Water, and Weather Services And Statistics: <http://www.nws.noaa.gov/om/hazstats.shtml#>

NWS Tropical Prediction Center: <http://www.nhc.noaa.gov>

NWS Storm Prediction Center: <http://www.spc.noaa.gov/>

NWS River Forecast Centers: <http://www.noaa.gov/nwsrhc.html>

National Severe Storms Laboratory: <http://www.nssl.noaa.gov/>

Southeastern Idaho Hydrology: <http://www.wrh.noaa.gov/Pocatello/hydro/index.html>

Reservoir Information: <http://140.218.6.36/hydromet/burea.html>

Bureau Of Reclamation River Gauges: <http://mac1.pn.usbr.gov/hydromet/realtime.html>

Idaho Climate Summaries: <http://www.wrcc.dri.edu/summary/climsmid.html>

Climate Prediction Center: <http://www.cpc.ncep.noaa.gov/>

U.S. Drought Monitor/Assessment: <http://www.drought.unl.edu/dm/monitor.html>

Severe Weather Warnings Page: <http://Kamala.cod.edu/svr/>

Geostationary Satellite Images: <http://www.ssec.wisc.edu/data/geo.html>

Idaho Road Report (Idaho Transportation Department): <http://164.165.237.41/RoadReport/>

SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

The Weather Question Corner: If you would like a weather question answered, please write or call so we can put it in our quarterly newsletter. Today's question comes from kids and adults alike who want to know ***"Why Is The Sky Blue?"***

ANSWER TO: Why is the Sky Blue?

I. To begin, let's think about **when is the sky NOT blue** and **where is it NOT blue??** By doing this, you will actually come up with 2 basic properties needed to produce a sky color.

Answers: The sky is NOT blue: 1) at night
2) around sunrise and/or sunset
3) when a lot of pollutants exist
4) on the moon

Based on answers 1 & 4, we can come up with 2 properties needed. Answer 1 lets us know that at night, there is no sunlight and therefore no sky color, (other than pitch black). Answer 4 tells us that since the moon has virtually no atmosphere, sunlight alone will not produce a sky color.

So far, we can conclude that sky color is the result of sunlight interacting with our atmosphere. We need **Sunlight and Air.** Answer 2, the sky is usually seen as a reddish or orange color and less blue; we will see why a little later on. Answer 3, whenever we have a lot of dust/dirt in the air, the sky is hazy/milky white or even brown at times.

Given the above, before proceeding, we need to talk about some facts and information regarding our atmosphere, our sun, and the nature of light. Then we can move forward and see how these interact to create the blue color we normally see.

II. Facts About Our Atmosphere

- Our atmosphere is about 90 miles thick; however, it is only within about the first 40 miles that contain the bulk of our atmospheric gases. Our atmosphere is thicker at the equator and thinner at the poles. That's why our atmosphere looks "pear shaped", with a slight bulging at the equator.
- The atmosphere is divided into 4 layers based on Temperature trends:
- The TROPOSPHERE: Where all weather and clouds take place. This extends from the ground up to approximately the first 10 miles of air. Temperature decreases with increasing height.
- The STRATOSPHERE: The next 30 miles above the Troposphere make up the Stratosphere. This is where the Ozone layer is located. The Ozone layer is so delicate and thin and that if compressed down to the ground, it would only be as thick as a dime! Temperature increases as you go up in the stratosphere due to the making of ozone.
- The MESOSPHERE: The next 50 miles above the stratosphere make up the Mesosphere. This is the coldest layer of the atmosphere. At the top of the Mesosphere, temperatures decrease to near -150 degrees Fahrenheit.
- The THERMOSPHERE: A quick increase in the temperature because of the absorption of energy from the sun. The Thermosphere is divided into 2 parts....The IONOSPHERE and the EXOSPHERE.
- Our Earth's Gravitational Field holds our atmosphere in place.
- If there were no air molecules or atmosphere, then our sky would appear pitch black and stars would be seen all day.
- Composition of our atmosphere in dry air is 78% Nitrogen, 21% Oxygen, and less than 1% of Carbon dioxide and Argon. Water Vapor varies from near zero to 4%.
- Nitrogen enters the atmosphere through the decay of plants and vegetables. Also, rice paddies, cows burping, and termites give off nitrogen.
- Oxygen comes directly from the air and plants, and green plants make oxygen during photosynthesis. We give off Carbon Dioxide when exhaling. Even though the percentage mentioned above is small, without Carbon Dioxide, plants could not produce Oxygen.

SOUTHEAST IDAHO SPOTTER NEWS

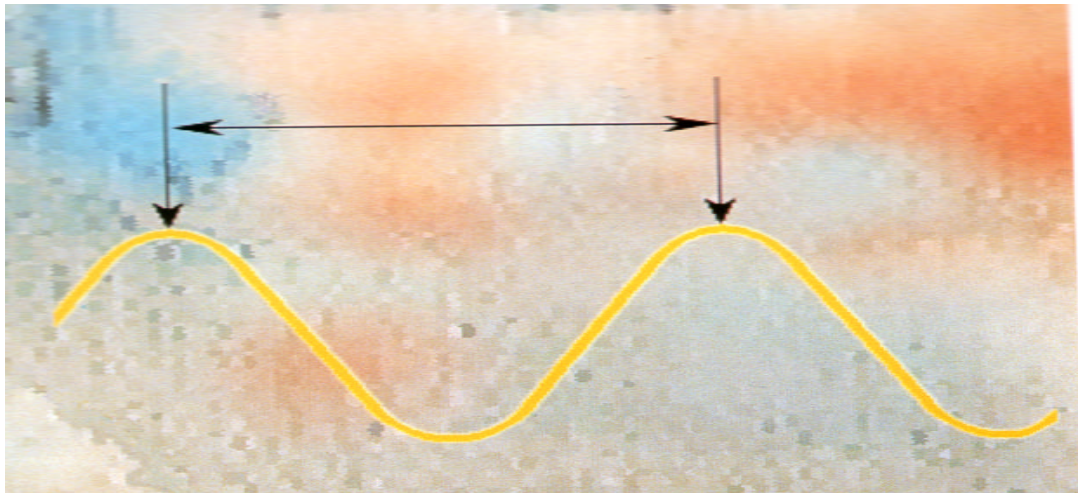
National Weather Service Pocatello/Idaho Falls

III. Facts About Our Sun

- The sun is a big atomic furnace that stays lit by converting hydrogen into helium. When hydrogen atoms fuse together to form one helium atom, a tremendous amount of energy is released.
- By weight, the sun is 70% hydrogen, 28% helium, 1.5% carbon, nitrogen and oxygen.
- The Sun's temperature is 10,000 degrees Fahrenheit at the surface and 27,000,000 degrees Fahrenheit at the center.
- The Sun's diameter is 870,000 miles...109 times larger than the earth. Its volume is big enough to hold over 1 million Earths.
- The Earth is on average 93,000,000 miles away from the Sun.
- It takes light 8 and ½ minutes to travel from the Sun to the Earth. We get this by knowing the fact we are 93,000,000 miles away and the speed of light is 186,000 miles per second. $93,000,000/186,000 = 500$ seconds = 8 and ½ minutes.
- We are closest to the sun on/around January 4th at a distance of around 90,000,00 miles and farthest from the sun on/around July 4th at a distance of around 96,000,000 miles. It is our tilt of 23 and ½ degrees that gives us our seasons, NOT our distance from the sun. We (northern hemisphere) are tilted toward the sun in July (summer) and tilted away in January (winter).

IV. Facts About the Nature of Sunlight

- The sun's energy is known as Electromagnetic Radiation. In the electromagnetic spectrum, there are several kinds of electromagnetic radiation including gamma rays, x-rays, ultraviolet waves, visible waves, infrared waves and radio waves.
- All of these types of energy are propagated or move as waves, and the key feature that distinguishes one type from another is their Wavelength.
- The wavelength of a particular type of electromagnetic radiation is defined as the distance between two successive points in the wave, i.e., from crest to crest or trough to trough.... see the example below.



SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

- The shorter the wavelength, the greater the frequency. The frequency is the number of complete vibrations, oscillations, or wavelengths completed over a given time period. This is the most important fact as to why the sky is blue!
- The shortest waves are only a few trillionths of an inch (or centimeter) long, while the longest are measured in hundreds of miles.
- Visible Light, which we are concerned with, includes wavelengths that measure between 155 and 275 billionths of an inch...extremely small.
- Sunlight is known as "White Light." White Light of the sun contains within it ALL the different colors of Visible Light or better known as the 7 Colors of a Rainbow. Easily remembered by ROYGBIV, White Light is the sum of Red, Orange, Yellow, Green, Blue, Indigo, and Violet. These colors are in order from the Longest Wavelength (Red) to the Shortest (Violet); or from a frequency standpoint, from the lowest, Red, to the highest frequency, Violet.
- 2 Major Properties of Light: Light tends to travel in a straight line, unless some outside force influences it. Light can be (1) reflected meaning it can bounce off of certain kinds of material (smoke or dust) and travel in another direction because these particles are relatively large, thousands of times larger than the wavelength of light. This phenomenon can be observed in a smoky room with sunlight streaming through a window. You can watch the sunbeams change direction as they reflect off thicker patches of smoke.
- But in explaining why the sky is blue, we need to think about much smaller material that light rays encounter. The sunlight needs to pass through our 90-mile thick atmosphere before reaching our eyes, and in doing so, must pass through millions upon millions of air molecules. So the difference you are going to see now is that when the sky is clear and no smoke or dust or any other large particles are present, the sky still contains gases, i.e., mainly Nitrogen and Oxygen. These gases are very small and do not directly reflect light, but the effect on light is something we call (2) scattering, which is defined in the next paragraph.

V. SO WHY NOW IS THE SKY BLUE MOST OF THE DAY?

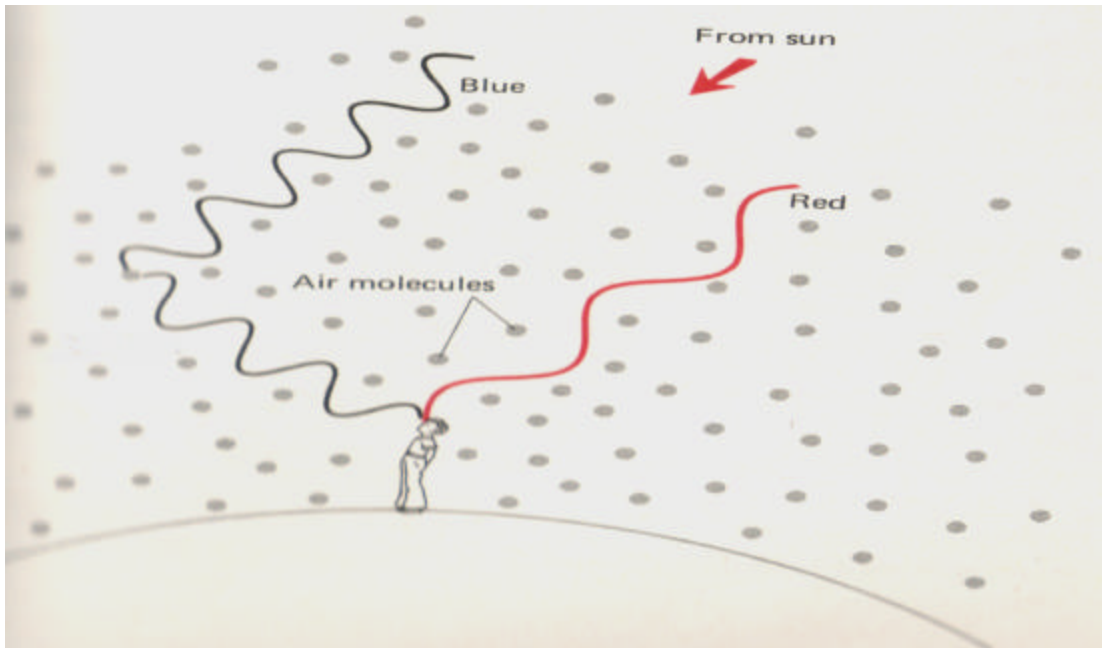
When solar radiation (sunlight) enters our gaseous atmosphere, the white light of the sun, (ROYGBIV, a mixture of all these different colors of visible light) travels towards the earth at incredible speeds of 186,000 miles per second. The light encounters very small gases having wavelengths of approximately one thousand times smaller than the wavelength of visible light. Remember, air molecules are so small that not only are they smaller than cloud droplets, but they are also far smaller than light waves. As these light waves try to bypass all of these air molecules, this leads us to define a phenomenon called "scattering". ***Scattering is a process in which the gaseous molecules alter the course of light and send it off in every possible direction, not just one direction. The key to all of this is that these different wavelengths of light, (ROYGBIV) are not equally affected by the air molecules. If they all were equally scattered, then the resultant color we would see is white.***

*NOTE (A good example of this: cloud droplets, both liquid and ice suspended inside of a cloud reflect all the colors equally well. Why? Because as mentioned above, cloud droplets are large compared to the wavelength of light; therefore, they reflect all colors equally well because no wavelengths of light can bypass them. When a puffy cumulus cloud floats by, the sides of the cloud are bright white when they are in direct sunlight. The reason for this is because each of the cloud droplets reflects sunlight and the reflected sunlight makes the sides of the cloud bright white. The cloud appears white rather than blue because the cloud droplets reflect ***all*** colors of light equally well. Also, students often ask, "Why is snow white?" Same reason...because each snowflake or ice crystal falling to the ground reflects ***all*** colors of sunlight or white light equally well.)

SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

Now, the shortest wavelengths of sunlight, blue/indigo/violet are most susceptible to this scattering effect than the longer wavelengths of red/orange/yellow. The shorter wavelengths have the greatest frequency. So, the shorter the wavelength of light, the more difficulty it has bypassing the air molecules and the more likely that it will strike the molecules and be scattered in some other direction, bouncing all over the sky and entering our eyes from all directions, giving the overall blue impression we see. This is maximized when sunlight travels toward the earth's surface straight on or at a nearly perpendicular angle, or when the sunlight is streaming toward us from a very **high** position in the sky, i.e., during the midday hours. The other longer wavelengths of light are not scattered as much because of the very nature of their wavelength appearance, having almost a straight-line wavelength appearance through the atmosphere. Another way of understanding this is to remember from our mathematics, that the shortest distance between any two points is always a straight line. Thus, the shorter blue wavelength would be in the atmosphere longer, being scattered out more than the longer wavelength red. As a result, the red wavelength easily bypasses the air molecules, so the longer wavelength colors are not being "scattered" nearly as much. So, once they do make it all the way down to our eyes, we perceive them as the white sphere of the sun. Thus, it is these scattered, short wavelengths of light that flood our vision when we gaze up and make the sky appear blue. See the figure below for a visual description of what we just talked about.



VI. BUT IF VIOLET HAS THE SHORTEST WAVELENGTH AND HIGHEST FREQUENCY, WHY IS THE SKY NOT VIOLET?

In the Visible Light Spectrum, violet is scattered the most because it has the shortest wavelength and the greatest frequency. But there are two reasons why we see the sky as blue and not violet.

- 1) There is just more blue light than violet light in direct sunlight, so as the scattering process continues, blue dominates with very little violet, and
- 2) Our eyes and brain are just more sensitive to seeing blue light than violet light.

SOUTHEAST IDAHO SPOTTER NEWS

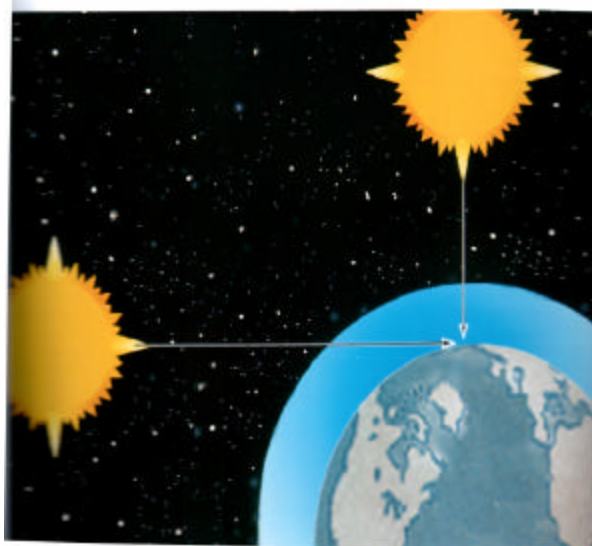
National Weather Service Pocatello/Idaho Falls

VII. SO WHY IS THE SKY MORE RED/ORANGE AT SUNRISE AND SUNSET?

Why is the sky so much more colorful under a rising/setting sun compared to the even blue tone we see during most of the day? Well, let's begin with what we see on almost a daily basis. Near sunrise and sunset, the sun and horizon sky turn red. You probably have noticed that the sun is not so bright at sunset as it is during midday. This is because when the sun is near the horizon, the sun's rays must pass through at a lower angle through the atmosphere. Remember, that at the beginning and at the end of the day, we observe sunlight streaming toward us from a very **low** position in the sky. The light that reaches our eyes now has passed through considerably more atmosphere than the rays of the noonday sun. (See the diagram below). As the various colors of sunlight pass through this **increased distance of air**, the blue wavelengths are now scattered out so much more, that this increased amount of scattering or secondary scattering as we call it, progressively depletes the blue color. So near sunset, as the direct sunlight approaches our eyes, more and more of the shorter wavelengths, i.e. green, blue, indigo and violet get scattered out by the air molecules and are basically removed from the direct sunbeam. At the same time, the longer wavelengths of light, including red and orange, penetrate this larger volume of air. After a while, the only light left in the direct sunbeam in appreciable amounts is the longer wavelengths, i.e., Red and Orange.

But there are other factors that contribute to a really top-notch sunset. Having plenty of clouds around helps out, since clouds are a mixture of water vapor and dust/dirt particles. Both of these components have strong influences on light, mainly reflecting it directly rather than scattering it, displaying the brilliant shades of colors of the visible light emitted by the sun. Some of the most spectacular sunsets occur when the air contains large amounts of particulate matter. One source of such atmospheric contamination is forest fires, which can fill the air with smoke and ash. This causes intense coloration of the entire sky, especially when the sun is on the horizon. Volcanoes and even air pollution cause some spectacular sunsets as well.

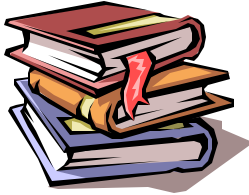
But keep in mind that the main answer for the colorful sunsets and sunrises that we observe is the increased distance light must travel through the atmosphere to reach us. Just remember that during midday, the sun's direct angle sends light through the minimum amount of atmosphere, which favors the scattering of white light with the shortest wavelengths, i.e., blue, indigo and violet; but at dawn and dusk, the sunlight must pass through more air, an event that increases scattering of the longer wavelengths as opposed to the shorter ones. Again, I refer you to the picture below.



SOUTHEAST IDAHO SPOTTER NEWS

National Weather Service Pocatello/Idaho Falls

Weather Quiz: Time to test your weather knowledge...(Answers on back)



1. Which kills more people every year?
 - a. Flash Floods
 - b. Lightning
 - c. Hurricanes
 - d. Tornadoes
2. If you are caught outdoors during a Tornado, where is it safest?
 - a. inside a car
 - b. under an overpass
 - c. in a ditch
 - d. under a tree
3. What is the average speed of a falling snowflake?
 - a. ½ mph
 - b. 7 mph
 - c. 15 mph
 - d. 20 mph
4. What is the average speed of a falling raindrop?
 - a. 1 to 5 mph
 - b. 7 to 14 mph
 - c. 25 to 30 mph
5. Which of the following is true...always and everywhere:
 - a. Air Pressure decreases with height
 - b. Winds blow counterclockwise around low pressure
 - c. The Humidity decreases with height
 - d. The Temperature decreases with height
6. When you are cold and start to shiver, what has been shown to interrupt this?
 - a. Thinking about Hawaii
 - b. Doing mental mathematics
 - c. Humming

Detailed Answers to the Weather Quiz:

1. Which kills more people every year?

- a. Flash Floods**
- b. Lightning
- c. Hurricanes
- d. Tornadoes

Flash Flooding replaces lightning as the #1 cause of deaths associated with thunderstorms. During the past 30 years, approximately 140 deaths occurred per year due to Flash Flooding with about 80 of those due to pedestrians trying to drive through flooded roadways! Lightning killed about 73 people per year; Hurricanes killed an average of 16 people per year while 68 deaths per year were caused by tornadoes.

2. If you are caught outdoors during a Tornado, where is it safest?

- a. inside a car
- b. under an overpass
- c. in a ditch**
- d. under a tree

If you are caught outdoors during a tornado, then the safest place would be in a low spot like a ditch or ravine. You will be safer from flying debris by doing this. Always abandon a car, since flying debris and the erratic direction of a tornado can put you in a deadly situation. Under an overpass would be a secondary safe haven, but not the best simply because of the flying debris and possible destruction of the overpass. Under a tree is probably the worst place to be, as you become a prime target for trees and other flying debris to cause injury or even death.

3. What is the average speed of a falling snowflake?

- a. 1/2 mph**
 - b. 7 mph
 - c. 15 mph
 - d. 20 mph
-

4. What is the average speed of a falling raindrop?

- a. 1 to 5 mph
- b. 7 to 14 mph**
- c. 25 to 30 mph

The average raindrop speed is 7mph but can be up to 14mph for some of the larger droplets

5. Which of the following is true... always and everywhere:

- a. Air Pressure decreases with height**
- b. Winds blow counterclockwise around low pressure
- c. The Humidity decreases with height
- d. The Temperature decreases with height

Air Pressure always decreases with height. Pressure is defined as the amount of air molecules exerting pressure on you. Gravity continuously pulls these air molecules towards the ground. As you rise up in the atmosphere, air molecules become scarce and as a result the amount of exertion or pressure decreases. An example: If you rise about 18,000Ft in the atmosphere, you will find that for the most part, half of the atmosphere is below you and half is above you. As for the other choices, winds do blow counterclockwise in the Northern Hemisphere, but clockwise in the Southern Hemisphere. Humidity and Temperature both can increase in height, i.e. temperature inversion.

6. When you are cold and start to shiver, what has been shown to interrupt this?

- a. Thinking about Hawaii
- b. Doing mental mathematics**
- c. Humming

For reasons still unknown, lab results have shown that there is an odd connection between shivering and mental mathematics. It seems that the part of the human brain that controls shivering is the same part that is used when figuring numbers in your head. Now I understand why meteorologists rarely shiver.

SEE YOU IN OCTOBER!